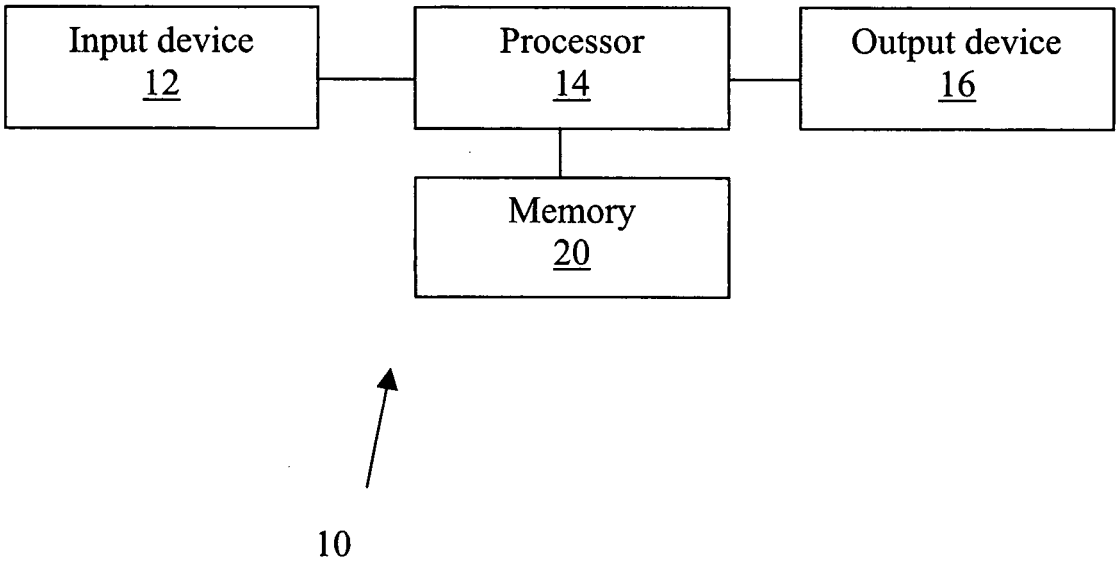

FIG. 1

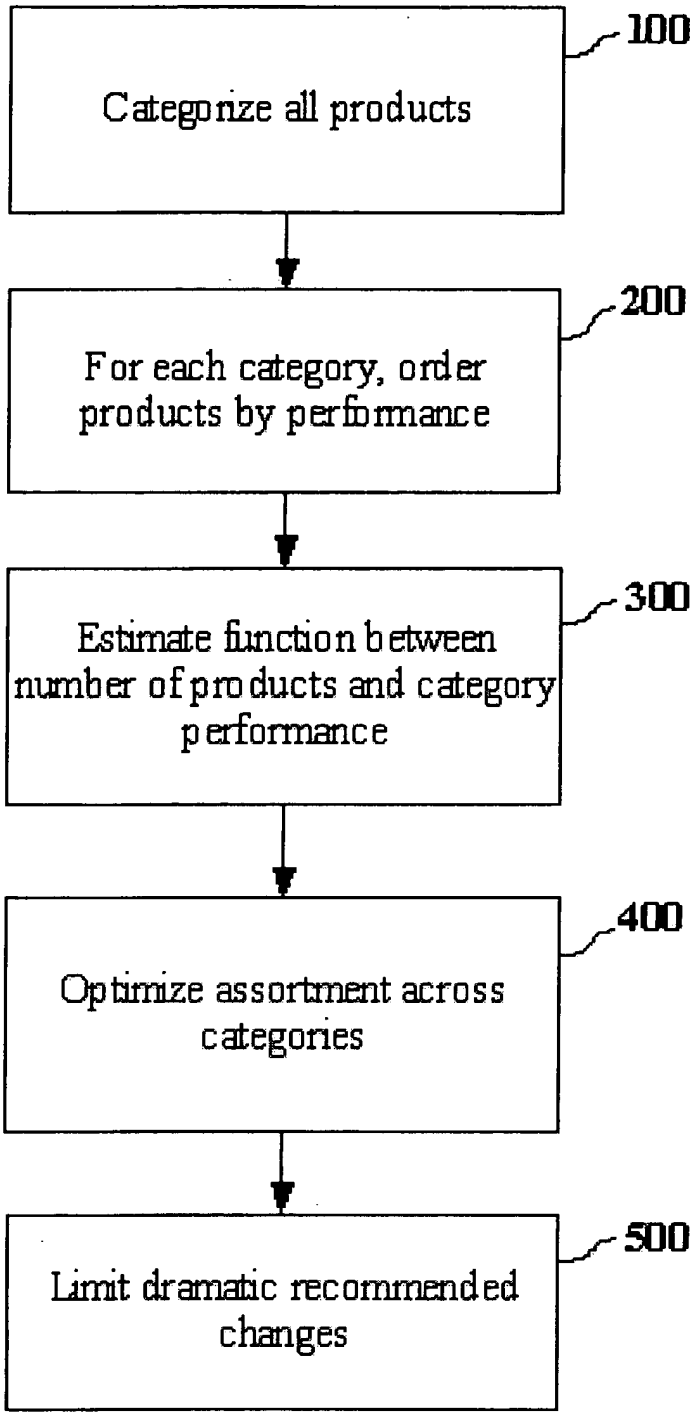
Categorize all products
100
For each category, order products by performance
200
Estimate function between number of products and category performance
300
Optimize assortment across categories
400
Limit dramatic recommended changes
500

FIG 2

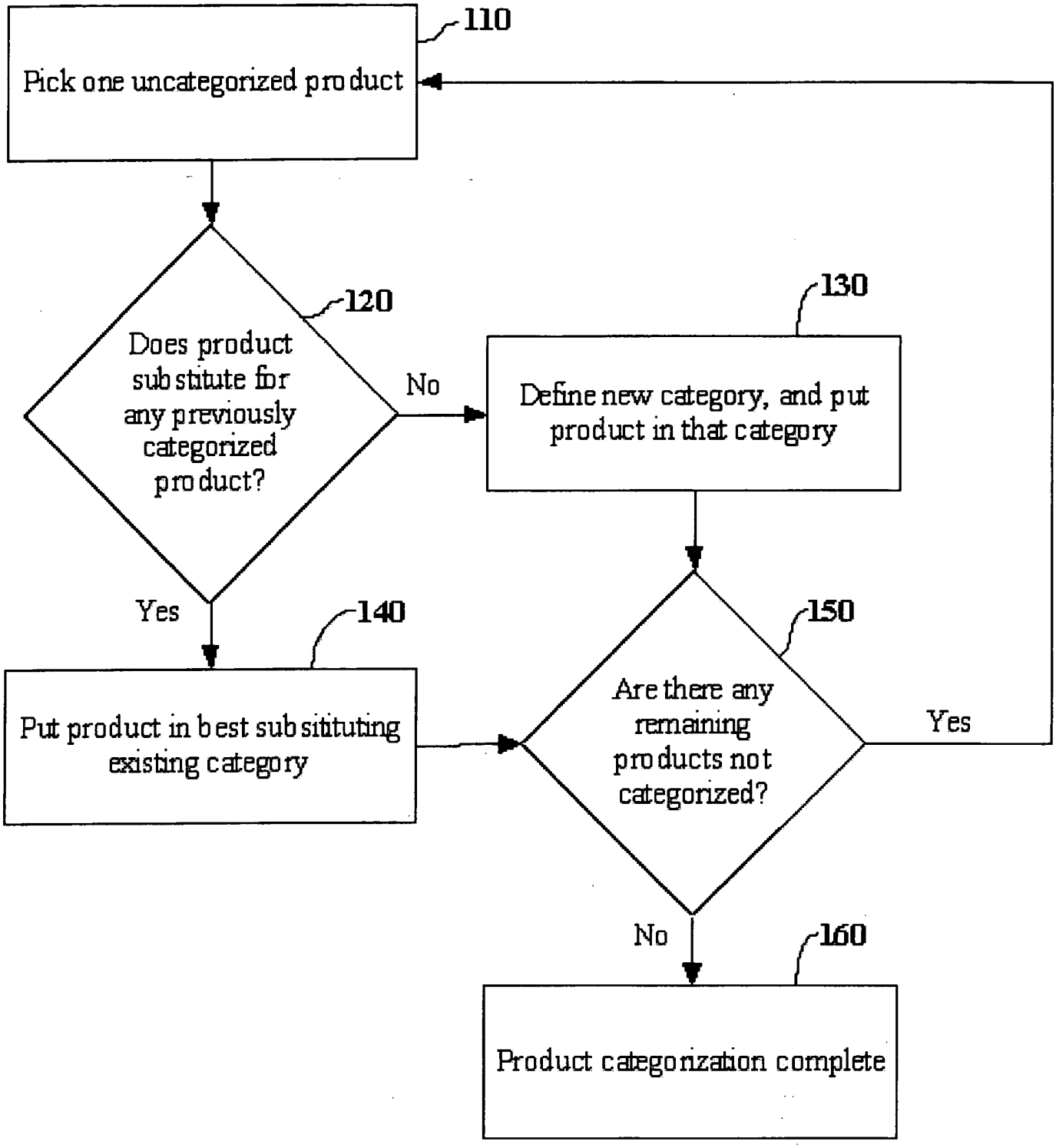
110
Pick one uncategorized product
120
Does product substitute for any previously categorized product?
No
130
Define new category, and put product in that category
Yes
140
Put product in best subsitituting existing category
150
Are there any remaining products not categorized?
Yes
No
160
Product categorization complete

FIG 3

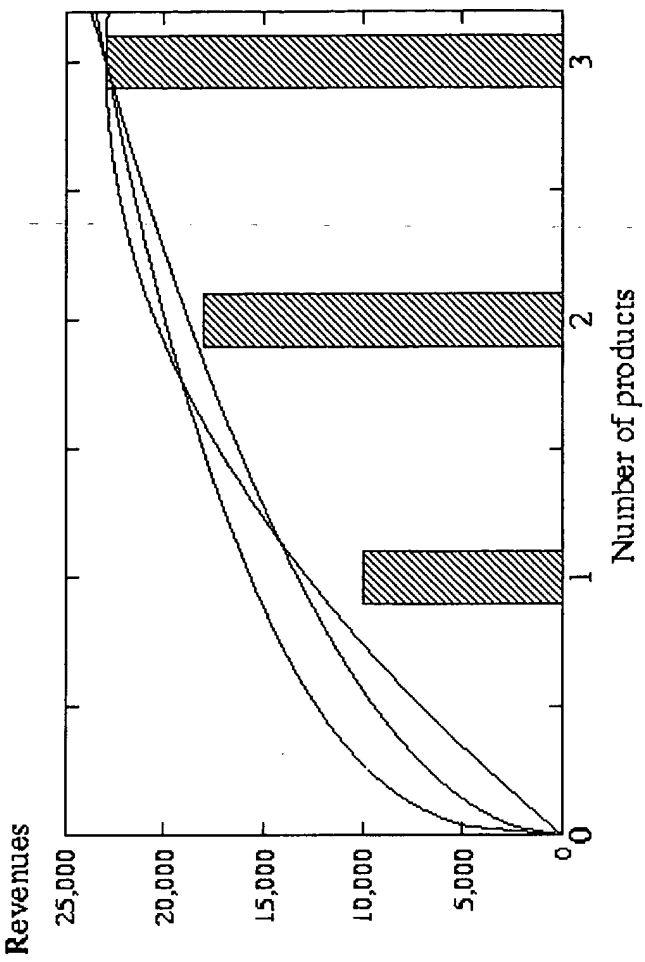
Revenues
25,000
20,000
15,000
10,000
5,000
0
0
1
2
3
Number of products

FIG. 4A

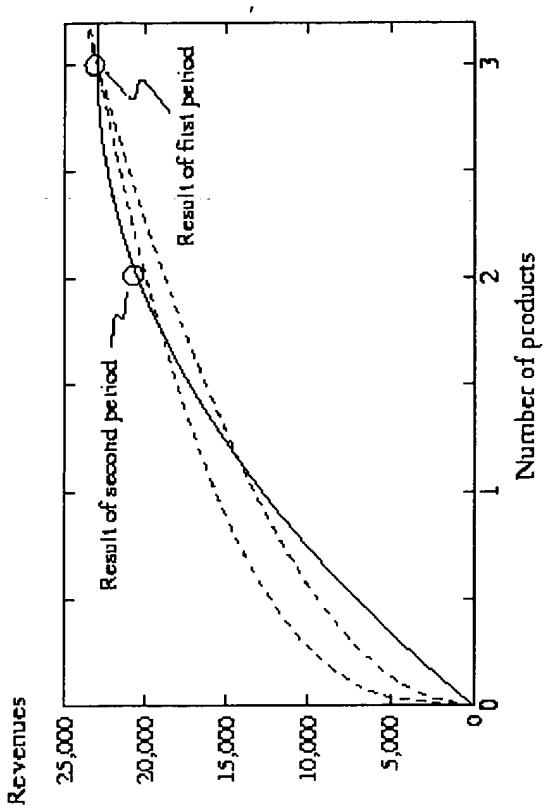
Revenues
25,000
20,000
15,000
10,000
5,000
0
0
1
2
3
Number of products
Result of second period
Result of first period

FIG. 4B

Data		
Category	Product	Sales
Toothbrus	Product A	7,200
Toothbrus	Product B	7,000
Toothbrus	Product C	6,000
Toothbrus	Product D	5,000
Toothbrus	Product E	4,000
	Total	29,200

FIG. 5A

Model and Predictions			
Products	Min level	Square Root	Second degree
1	7,200	13058.6	8435.56
2	14,200	18467.7	15573.3
3	20,200	22618.2	21413.3
4	25,200	26117.3	25955.6
5	29,200	29200	29200
6	29,200	31987	31146.7
7	29,200	34549.9	31795.6

FIG. 5B

Square root model	
P=alpha*sqrt(n)	
alpha	13058.6

FIG. 5C

Second degree polynomial model	
P=beta*n + gamma*n^2	
Esimated saturation number	7
beta	9084.44
gamma	-648.889

FIG. 5D

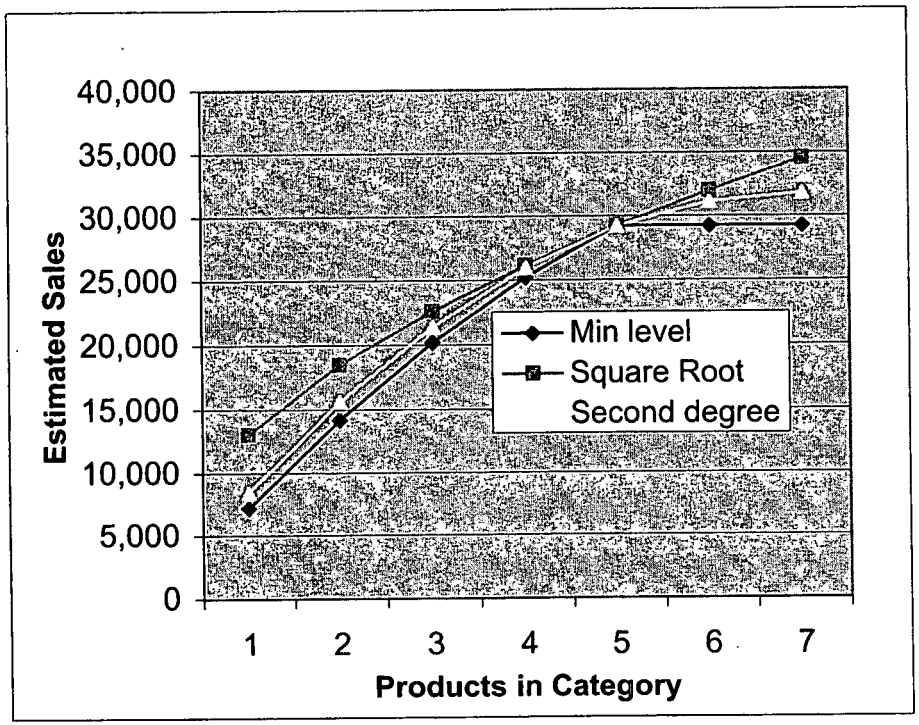
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Estimated Sales
1
2
3
4
5
6
7
Products in Category
Min level
Square Root
Second degree

FIG. 5E

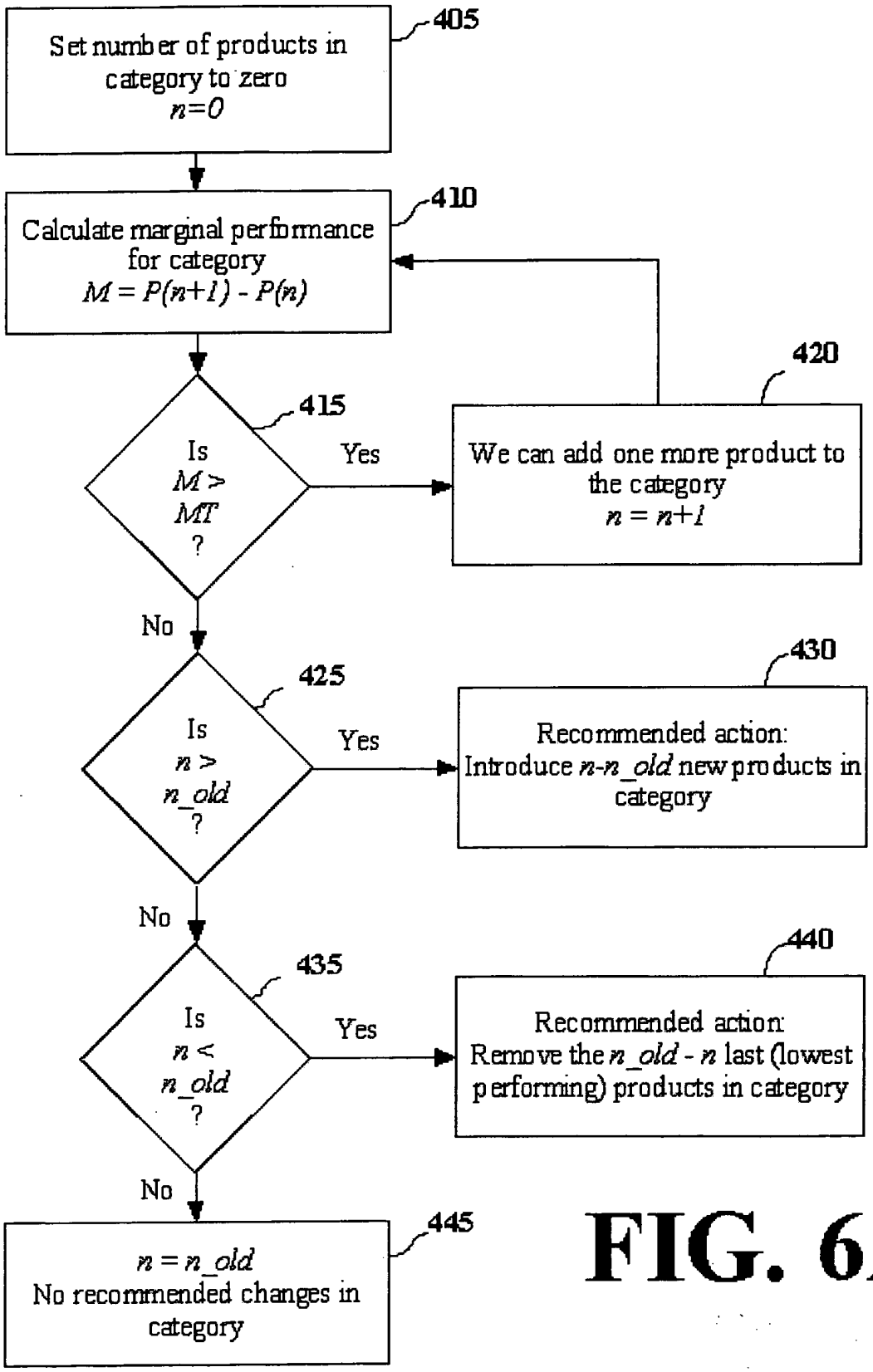
Set number of products in category to zero
n=0
405
Calculate marginal performance for category
M = P(n+1) - P(n)
410
Is M > MT ?
415
Yes
We can add one more product to the category
n = n+1
420
No
Is n > n_old ?
425
Yes
Recommended action: Introduce n-n_old new products in category
430
No
Is n < n_old ?
435
Yes
Recommended action: Remove the n_old - n last (lowest performing) products in category
440
No
n = n_old
No recommended changes in category
445

FIG. 6A

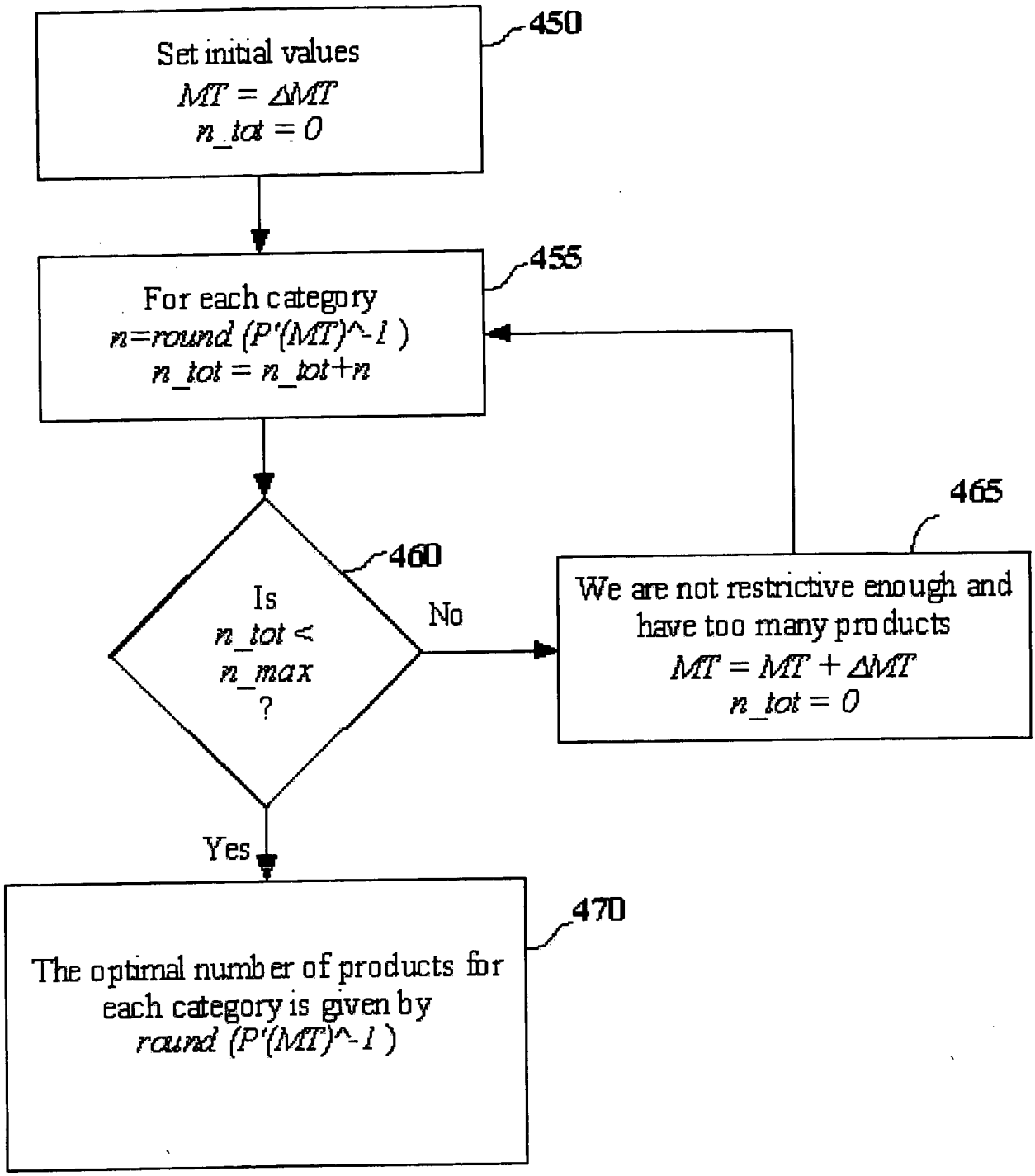
Set initial values
MT = ΔMT
n_tot = 0
450
For each category
n=round (P'(MT)^-1)
n_tot = n_tot+n
455
Is
n_tot <
n_max
?
460
No
We are not restrictive enough and have too many products
MT = MT + ΔMT
n_tot = 0
465
Yes
The optimal number of products for each category is given by
round (P'(MT)^-1)
470

FIG 6B

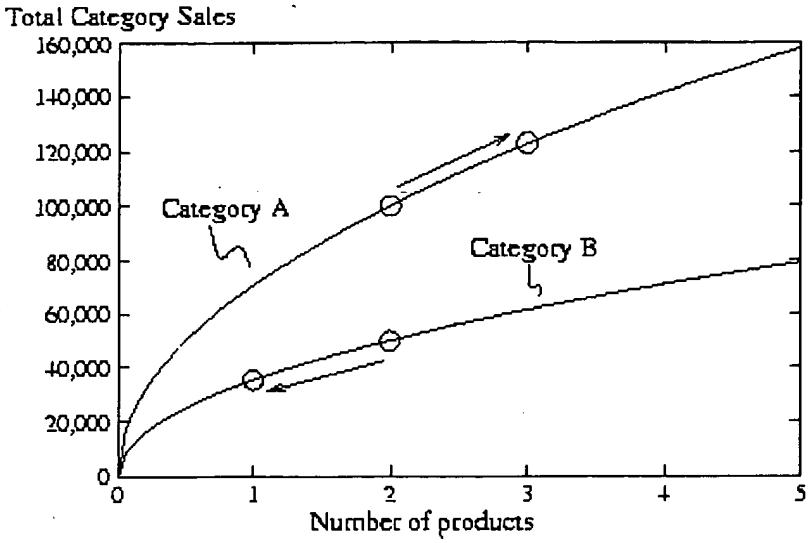
Total Category Sales
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Category A
Category B
0
1
2
3
4
5
Number of products

Fig 7A

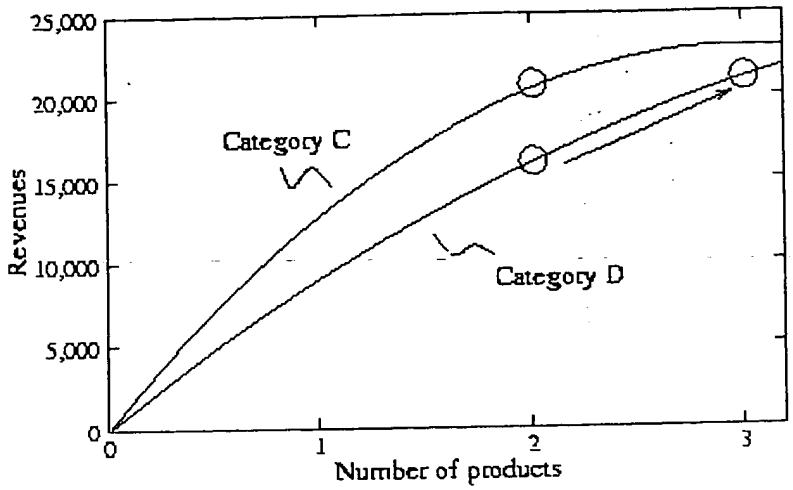
25,000
20,000
15,000
10,000
5,000
0
Revenues
Category C
Category D
0
1
2
3
Number of products

Fig 7B

Data and Model			
Category	Current Products	Current Sales	Parameter alpha
Toothbrushes	6	20,000	8164.96581
Toothpaste	4	10,000	5000
Dental Floss	1	5000	5000
Mouth Wash	3	6000	3464.10162
Total	14	41000	

FIG. 8A

Performance Threshold Optimization					Change Limits		
Threshold				1300	Max size modification		2
	Recommended Number	Number Change	Estimated Revenues	Revenues Change	Limited Change Number	Estimated Revenues	Revenue Changes
Toothbrushes	10	4	25819.89	5,820	8	23094.01	3,094
Toothpaste	4	0	10000	0	4	10000	0
Dental Floss	4	3	10000	5,000	3	8660.254	3,660
Mouth Wash	2	-1	4898.979	-1,101	2	4898.979	-1,101
TOTAL	20	6	50718.87	9718.87	17	46653.24	5,653

FIG. 8B

Max Total Performance Optimization					Change Limits			
Max Products	14	Optimize!			Max size modification			1
Implied Threshold	1548.71609							
	Recommended Number	Number Change	Estimated Revenues	Revenues Change	Limited Change Number		Estimated Revenues	Revenue Changes
Toothbrushes	7	1	21602.47	1,602		7	21602.47	1,602
Toothpaste	3	-1	8660.254	-1,340		3	8660.254	-1,340
Dental Floss	3	2	8660.254	3,660		2	7071.068	2,071
Mouth Wash	1	-2	3464.102	-2,536		2	4898.979	-1,101
TOTAL	14	0	42387.08	1,387		14	42232.77	1,233

FIG. 8C